

### REMARKS

The Final Office Action issued December 10, 2002 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claims 6-9 and 20 were canceled without prejudice or disclaimer in the respective amendments filed August 09, 2001 and May 06, 2002. Claim 3 has been amended. Claims 10-19 have been allowed. Claims 21-23 are withdrawn from consideration pursuant to an election requirement. Accordingly, Applicants request reconsideration of the pending claims 1-5, 10-19, and 21-23.

Applicants thank the Examiner for indicating that claims 10-19 have been allowed.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Daly.

The Office Action acknowledges that Daly fails to show or describe the claimed invention as a whole. The Office Action specifically identifies that Daly fails to provide: (1) a swirl generator with a guide disk contiguous to a flat disk; and (2) a direct injection fuel injector. The Office Action concludes that it would have been obvious to one of ordinary skill in the art as a matter of routine skill to form two contiguous flat disks from a one piece member of Daly. The Office Action also concludes that it would have been obvious to employ the fuel injector of Daly as a direct injection fuel injector.

First, Daly states that the member 18 is configured to minimize a trapped volume of fuel by having an increase in the cross-sectional area of the member 18 between the outer perimeter of the member and the central opening 25. *See*, Daly at column 3, lines 5-18. One of ordinary skill would not be motivated to modify the single piece member 18 of Daly into a multi-piece member with a constant cross-section because such modification could increase—instead of minimizing—a trapped volume of fuel in Daly, and therefore could render Daly unsatisfactory for its intended purpose.

Applicants respectfully assert that the Office Action fails to provide a sound basis as to why one of ordinary skill in the art would have been motivated at the time the invention was made to modify Daly to reach the claimed invention, as required by MPEP § 2143.03. And although the claimed invention is not within the routine skill of one ordinary skill in the art, even if this were a possibility as a matter of routine skill, this possibility is not sufficient, by itself to support a *prima facie* case of obviousness without some objective teaching for the proposed modifications, especially when the proposed modifications to the prior art invention could

prevent the prior art invention from functioning for its intended purpose as discussed above. *See*, MPEP § 2143.01, page 2100-124 (8th Ed., August 2001). Accordingly, claims 1 and 2 are patentable over Daly because a *prima facie* case of obviousness has not been established.

Second, Daly provides for a resin or plastic bodied fuel injector, in a preferred embodiment, and does not provide for a metallic cylindrical annulus with an inner diameter that maintains an operative relationship when exposed to operating temperatures of a cylinder of an engine in a direct injection environment. That is, Daly fails to teach or suggest a metallic cylindrical annulus to achieve the claimed function of maintaining an operative relationship when exposed to operating temperatures of a cylinder of an engine. Moreover, Daly fails to teach or suggest that the plastic-bodied fuel injector is capable of maintaining an operative relationship when exposed to the operating temperature of the cylinder of the engine.

Applicants respectfully note that the functional recitation is a positively recited feature that must be considered “[j]ust like any other limitation of the claim ...,” as set forth in MPEP § 2173.05(g) at page 2100-201. And the conclusion that Daly is capable of performing the same function by the Office Action must be supported by some explanation or objective evidence for such conclusion. Accordingly, claims 1 and 2 are patentable over Daly because Daly fails to teach or suggest features of the claimed invention as a whole.

Claims 3-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wieczorek in view of Muller.

Amended claim 3 recites a direct injection fuel injector that includes, *inter alia*, a metallic cylindrical annulus that maintains an operative relationship when the body is exposed to operating temperatures of a cylinder of an engine. Support for the amendment to claim 3 is provided by the originally filed specification at, for example, page 5, lines 15-24 and Fig. 1. Furthermore, the recitations of the metallic cylindrical annulus have already been considered by the Examiner over the prior art because such feature has already been considered in other pending claims such as, for example, claim 1. Accordingly, Applicants request entry of the amendment to claim 3 because no new issue or matter has been presented.

The Office Action acknowledges that Wieczorek fails to teach or suggest the claimed invention as a whole. The Office Action specifically confirms that Wieczorek fails to provide for a swirl generator. The Office Action concludes that it would have been obvious to one of

ordinary skill in the art to replace the guide member of Wieczorek with a swirl generator and guide member of Muller to increase a divergence of a column of fuel of the proposed substitution.

Wieczorek provides for a resin or plastic bodied fuel injector that is apparently used in a non-direct injection environment and fails to provide a metallic cylindrical annulus that can achieve the claimed function of maintaining an operative relationship, as recited in claim 3. Muller, on the other hand, provides for a direct injection fuel injector that is configured to operate with different fuel pressure, temperature and flow rates than a non-direct injection fuel injector such as that of Wieczorek. Thus, one of ordinary skill in the art would not be motivated to substitute components from a direct injection fuel injector with a non-direct injection fuel injector because of the different operational requirements of each type of fuel injectors. And a direct substitution between two different types of injectors must be taught or suggested, otherwise the direct substitution is a mere picking and choosing of disparate elements in an attempt to reach the claimed invention as a whole.

Assuming, *arguendo*, that a direct substitution with the components from Muller is possible, Wieczorek provides for a guide member 26 spaced from a sealing surface of the seat 14. A direct substitution of the guide 26 of Wieczorek with the guide 35 and swirler 47 of Muller would provide for a swirler 47 of Muller spaced from the sealing surface of the seat 14 of Wieczorek instead of a “[s]wirl generator contiguous to the first surface of the seat,” as recited in claim 3. Thus, even if a direct substitution of a component of Wieczorek with the components of Muller could be done, as asserted by the Office Action, such direct substitution fails to teach or suggest all of the claimed features that are required in order to establish a *prima facie* case of obviousness, as sets forth in MPEP § 2143.03. And absent the benefit of Applicants’ disclosure, there is no motivation or suggestion to reconstruct Wieczorek or Muller, singularly or in combination, in an attempt to provide for the claimed invention as a whole. Accordingly, claim 3 is patentable over Wieczorek in view of Muller for at least these reasons.

Finally, the fuel injector of Wieczorek utilizes a specific configuration of a seat 14 and needle guide 26 so that a particle trap formed by well 34 of could be employed in Wieczorek. Muller, however, provides for a direct injection fuel injector that employs a specific fuel swirler configuration so that fuel can be swirled generally within the conical tapered sealing surface of

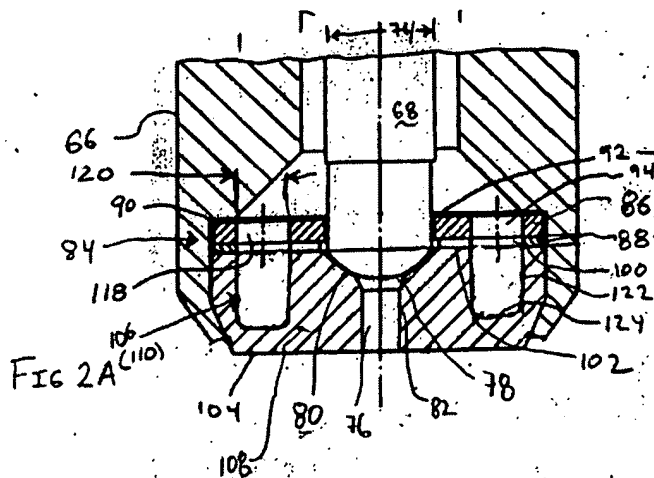
the seat 26 and out of the fuel injector through the discharge opening 32. A direct substitution of the guide element 35 and swirler 47 of Muller could obstruct the particle trap of Wieczorek, thereby changing one of the principle operations of the particular seat configuration of Wieczorek (col.1: 39-41). Therefore, absent the benefit of Applicants' disclosure, there is no motivation or suggestion to substitute components from a direct injection fuel injector (i.e., Muller) to a non-direct injection fuel injector (i.e., Wieczorek), especially when such substitution could change a principle operation of the non-direct injection fuel injector. Accordingly, claim 3 is patentable over the proposed combination of Wieczorek in view of Muller for at least this reason.

Claims 2-5, 22, and 23 depend ultimately from respective independent claims 1, 3 and 21, are therefore also allowable for at least the same reason as claims 1, 3 and 21, as well for reciting additional features.

The drawings have been objected by the Examiner for: (1) allegedly introducing new matter; and (2) allegedly failing to illustrate features recited in the claims. Applicants respectfully traverse.

First, the proposed Figs. 4A and 4B have been inappropriately characterized by the Examiner as introducing new matter. Applicants respectfully note that this Application, at its filing, incorporated by reference the entirety of at least the prior application S.N. 08/795,672, now U.S. Patent No. 5,875,972 to Ren. Therefore, Figs. 3 and 4 of Ren (now relabeled as proposed Figs. 4A and 4B) are part of this application and therefore are not new matter, as provided for in MPEP § 2163.07(b) at page 2100-173.

Second, the drawings have been objected to as failing to illustrate: (a) a swirl generator having a generally constant cross-section between an outer perimeter and a central aperture, as recited in claim 1; and (b) at least one slot extending tangentially from a fuel passage opening to the central aperture. With regard to the feature noted in (a) above, Applicants respectfully direct the Examiner's attention to originally filed Fig. 2A (reproduced at right), which illustrates, in the preferred embodiment, a swirl generator 84 that has



a constant cross-section between a perimeter 90 and central aperture 92. Should the Examiner require revisions of Figs. 2A and 2B to show each of the cross-sections of disks 88 and 86 as a solid section extending between the perimeter 90 and aperture 92, Applicants are prepared to provide such revision to the drawings upon request by the Examiner. With regard to feature (b) noted above, Applicants respectfully direct the Examiner's attention to Figs. 3 and 4 of U.S. Patent No. 5,875,972 to Ren, which were incorporated by reference as of the filing of this application and relabeled as Figs. 4A and 4B. Accordingly, the objections to the drawings should be withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to provide support for the feature of a constant cross-section of a swirl generator, as recited in the claims and therefore fails to reasonably convey to one skilled in the art that Applicants had possession of the claimed invention.

As stated in MPEP § 2163, “[a]n applicant shows possession of the claimed invention by describing the claimed invention ... using such descriptive means as words, structures, figures, diagrams and formulas that fully set forth the claimed invention.” Applicants respectfully assert that, at least at the time of filing of this application, the inventors had possession of the claimed invention.

In particular, Applicants have shown possession of the claimed invention as a whole as recited in claims 1 and 2 by a side view of Fig. 2A, of a cross-section extending through the longitudinal axis and plan views of the guide disk and swirl disk, as shown in Figs 3 and 4 of Ren (which were incorporated by reference and relabeled as proposed Figs. 4A and 4B). Depending on where a cross-section of the guide disk or swirl disk is taken on each of the plan views, (i.e., disks 86 and 88), one skilled in the art would glean that the cross-section of either disk 86 or disk 88 is constant between an outer perimeter and a central aperture. Thus, one skilled in the art would appreciate that the originally filed disclosure provides for the features of the claimed invention as a whole so as to clearly support that the originally filed application, including the drawings, unequivocally conveys that the inventors had possession of the claimed invention. Accordingly, the rejection for allegedly failing to provide a written description of the claimed invention should be withdrawn.

Claims 3-5 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants have amended claim 3 to provide for antecedent basis of the recitation of the surfaces recited in the claim. Accordingly, this rejection should be withdrawn.

**CONCLUSION**

In view of the foregoing amendments and remarks, Applicants respectfully request entry and consideration of the application because the amendment places the application in condition for allowance or in better form for appeal. Moreover, no new issues have been raised, no new matter has been entered, and no additional claims have been added by this Amendment.

Applicant respectfully invites the Examiner to contact the undersigned at (202) 739-5203 if there are any outstanding issues that can be resolved via a telephone conference.

**EXCEPT** for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

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